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EXAMINER	
LARKIN, DANIEL SEAN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/590,880	**Applicant(s)** POWLEY ET AL.	
	Examiner DANIEL S. LARKIN	**Art Unit** 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 10-12 are objected to because of the following informalities:

Re claim 10, claim line 6: The phrase “the first axis” lacks antecedent basis.

Re claim 10, claim line 7: The conjunction -- and -- should be inserted after the second occurrence of the term “axis”.

Re claim 11, claim line 1: The phrase “the second axis" lacks antecedent basis.

Re claim 12, claim line 2: The phrase “the part” lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 1-13, 17, and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims, claims 1 and 17, recite that the “servo direction vector (i.e. second axis 16) for the probe is at an angle not parallel and not perpendicular to an axis of the nominally spiral path (i.e. axis of rotation 14) and at an angle not parallel and not perpendicular to a place perpendicular to the axis of the at least part nominally spiral path during scanning of the object”. The specification, however, discloses, page 7, lines 8-12, that the second axis (16) is defined which is at an angle Φ to the rotation axis (14)

and which intersects the surface of the object (10); and that the second axis may be at any angle to the rotation axis (14) (but not parallel), whereby Figure 1 shows a second axis of forty-five degrees. In this embodiment, it appears that the “servo direction vector”, i.e. second axis may be any angle other than parallel to the “axis of the at least part nominally spiral path”, i.e. axis of rotation (14), which would include an angle perpendicular to the axis of rotation as well as parallel to a plane which is perpendicular to the axis of rotation. Although, the preferred embodiment, shown in Figure 1, recites the “servo direction vector”, i.e. second axis (16) being forty-five degrees, the detailed description of Figure 1, does not expressly preclude other angles, except for parallel to the axis of rotation. Thus, it does not appear that the specification supports such a narrow claim interpretation for all situations.

In an alternative embodiment, shown in Figure 3 and described on page 7, lines 21-24, the specification discloses that the second axis is rotated a part revolution about the axis of rotation and translated parallel to the axis of rotation. This embodiment would also appear to contradict Applicants’ most recent claim amendment by expressly disclosing that the probe is at an angle perpendicular, during initial contact, to the axis of rotation and parallel to the axis of rotation and perpendicular to a plane perpendicular to the axis of rotation during scanning.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,189,806 (McMurtry et al.).

With respect to the limitations of claim 14, McMurtry et al. disclose a method for scanning an object with a surface measurement probe comprising the steps of: **defining a first axis of the object;** McMurtry et al. disclose a cylindrical workpiece having an axis passing through the long axis of the workpiece.

defining a second axis, said second axis being at an angle to the first axis; McMurtry et al. disclose a second axis (i.e. the angle at which the probe approaches/contacts the workpiece) at an angle about the first axis because the probe has the ability to pivot, such that the probe can be placed one the workpiece at any angle desired.

rotating the second axis for an at least part revolution about the first axis and translating the second axis in a direction parallel to the first axis; and McMurtry et al. disclose that the probe is used to scan a cylindrical surface on a workpiece (12) using X, Y, and Z motors (MX, MY, MZ), col. 3, lines 17-19 and col. 6, lines 20-23. McMurtry et al. also disclose that the surface sensing device may be made to follow a spiral, helical or other form of circular motion, such that the surface sensing device can move a probe along an at least rotation about the first axis during a scanning operation. Translating the probe parallel to the long axis of the workpiece is part of the scanning to ensure that the entire surface of the workpiece is scanned.

moving the surface measurement probe to keep it on the second axis. McMurtry et al. disclose the probe is kept on the second axis in order to scan the surface of the workpiece through movement of the pivoting probe.

With respect to the limitation of claim 15, McMurtry et al. disclose that non-contact probes may be used, whereby the probe is at a distance (desired of course) from the surface of the workpiece which is within the operating range of the probe.. Thus, the distance of the probe is adjusted by the coordinate measuring means.

With respect to the limitation of claim 16, McMurtry et al. disclose that the probe is capable of being servoed in a direction perpendicular to the second axis to keep the probe on the second axis, given that the probe can be pivoted to any angle needed by the operator.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-13, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,189,806 (McMurtry et al.).

With respect to the limitations of claims 1 and 12, McMurtry et al. disclose a method for scanning an object with a surface measurement probe mounted on a coordinate positioning machine, the probe having a definable servo direction vector, the

method comprising the steps of: **using translational movement of the coordinate positioning machine to move the probe along an at least part nominally spiral path about an axis which intersects the object**; McMurtry et al. disclose that a surface sensing device is used to scan a cylindrical surface on a workpiece (12) using X, Y, and Z motors (MX, MY, MZ), col. 3, lines 17-19 and col. 6, lines 20-23. McMurtry et al. also disclose that the surface sensing device may be made to follow a spiral, helical or other form of circular motion, such that the surface sensing device can move a probe along an at least part nominally spiral scan about an axis which intersects the object/workpiece.

wherein the servo direction vector for the probe is directed nominally towards the axis of the at least part nominally spiral path; McMurtry et al. disclose that the servo direction vector for the probe (i.e. the angle at which the probe approaches/contacts the workpiece) is adjustable due to the probe's ability to pivot, such that the probe is directed nominally towards the axis of the at least part nominally spiral path. This would also allow the probe to have a servo direction vector of forty-five degree to the axis intersecting the workpiece.

and wherein the servo direction vector for the probe is at an angle not parallel and not perpendicular to said axis of the nominally spiral path and at an angle not parallel and not perpendicular to a plane perpendicular to said axis of the at least part nominally spiral path during scanning of the object. Again, the ability of the probe to pivot allows the servo direction vector of the probe to approach the object at an angle that is not parallel and not perpendicular to said axis of the

nominally spiral path and at an angle not parallel and not perpendicular to a plane perpendicular to said axis of the at least part nominally spiral path and scan the object under the same conditions.

With respect to the limitations of claims 2 and 3, McMurtry et al. teach use of a probe capable of being used on an object having an unknown surface profile and/or a free-form surface.

With respect to the limitations of claims 4 and 6, McMurtry et al. teach use of a contact probe, col. 2, lines 1-2, or a not contact probe, col. 1, lines 63-65.

With respect to the limitations of claims 5 and 7-9, McMurtry et al. teach use of a probe capable of moving parallel to the direction of the probe surface direction vector to control probe deflection and/or probe offset; and where the probe is rotated to keep its line of sight directed towards the axis which intersects the object; and/or perpendicular to the direction of the servo direction vector of the probe,

With respect to the limitations of claims 10, 11, and 13, McMurtry et al. teach uses capable of translational movement to move the probe by defining a second axis along which the probe servo direction vector is parallel, said second axis being at an angle to said axis which intersects the object, rotating the second axis for an at least part revolution about the first axis and translating the second axis which intersects the surface of the object to be measured in a direction parallel to the first axis, and moving the surface measurement probe to keep it on the axis, where the angle between the probe direction vector and the axis which intersects the object is varied during the scan.

With respect to the limitations of claim 17, McMurtry et al. disclose an apparatus, comprising: **a surface measurement probe mounted on a coordinate positioning machine, said coordinate positioning machine having drive means to enable the probe to be driven translationally in several axes;** McMurtry et al. disclose a surface sensing device used to scan a cylindrical surface on a workpiece (12) using X, Y, and Z motors (MX, MY, MZ), col. 3, lines 17-19 and col. 6, lines 20-23. McMurtry et al. also disclose that the surface sensing device may be made to follow a spiral, helical or other form of circular motion, such that the surface sensing device can move a probe along translationally in several axes.

a controller which controls said drive means to move the probe along an at least part nominally spiral path about an axis which intersects said object; McMurtry et al. disclose use of a controller that provides means by which the probe may follow a spiral motion, such that the surface sensing device can move a probe along an at least part nominally spiral scan about an axis which intersects the object/workpiece.

wherein the controller controls the drive means such that the servo direction vector of the probe is directed nominally towards the centre of said axis of the at least part nominally spiral path; and McMurtry et al. disclose that the controller controls the probe such that a servo direction vector for the probe (i.e. the angle at which the probe approaches/contacts the workpiece) is adjustable due to the probe's ability to pivot, such that the probe is capable of being directed nominally towards the center of the axis of the at least part nominally spiral path.

wherein the controller controls the drive means such that the servo direction vector of the probe is at an angle not parallel and not perpendicular to said axis of the at least part nominally spiral path and at an angle not parallel to a plane perpendicular to said of the at least part nominally spiral path. Again, the ability of the probe to pivot allows the servo direction vector of the probe to approach the object at an angle that is not parallel and not perpendicular to said axis of the nominally spiral path and at an angle not parallel to a plane perpendicular to said axis of the at least part nominally spiral path and scan the object under the same conditions.

With respect to the limitations of claim 18, McMurtry et al. teach uses capable of translational movement to move the probe by defining a second axis along which the probe servo direction vector is parallel, said second axis being at an angle to said axis which intersects the object, rotating the second axis for an at least part revolution about the first axis and translating the second axis which intersects the surface of the object to be measured in a direction parallel to the first axis, and moving the surface measurement probe to keep it on the axis.

Response to Arguments

7. Applicants' arguments filed 18 December 2008 have been fully considered but they are not persuasive.

With respect to Applicants' argument that McMurtry et al. fails to teach that "the servo direction vector of the probe is at an angle that is not parallel and not perpendicular to said axis of the nominally spiral path and at an angle not parallel and

not perpendicular to a plane perpendicular to said axis of the at least part nominally spiral path during scanning, the examiner respectfully disagrees. While Applicant's discussion of Figures 7 and 9 may prove Applicants' argument, the reference as a whole must be considered for what it teaches, specifically, that McMurtry et al. disclose that the probe may be located on the surface of a cylindrical workpiece, which broadly could be interpreted as being the sides of the workpiece. Movement of the probe occurs through the use of three motors that allow the probe to be moved in the X, Y, and Z directions. McMurtry et al. also disclose that the probe is capable of being moved in a spiral, helical, or other circular motion, which suggests that the probe is rotated around the cylindrical workpiece to perform a scanning operation. Additionally, the ability of the probe to pivot allows the servo direction vector of the probe to approach the object at an angle that is not parallel and not perpendicular to said axis of the nominally spiral path and at an angle not parallel and not perpendicular to a plane perpendicular to said axis of the at least part nominally spiral path and scan the object along a spiral path while rotating around the workpiece.

Conclusion

8. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL S. LARKIN whose telephone number is (571)272-2198. The examiner can normally be reached on 8:30 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel S. Larkin/
Primary Examiner, Art Unit 2856
08 April 2009